Structures, Processes, and Responses of Plants

6-2 The student will demonstrate an understanding of structures, processes, and responses of plants that allow them to survive and reproduce. (Life Science)

6.2.5 Summarize each process in the life cycle of flowering plants (including germination, plant development, fertilization, and seed production).
Taxonomy level: 2.4-B Understand Conceptual Knowledge

Previous/Future knowledge: In 1st grade (1-2.4), students summarized the life cycle of plants (including germination, growth, and the production of flowers and seeds). In 3rd grade (3-2.1), students illustrated the life cycle of seed plants.

It is essential for students to know that all flowering plants have similar life cycles. These life cycles include distinct stages. These stages include:

Germination
- When seeds are dispersed from the parent plant, they can either lay dormant or they can begin to grow immediately given the right conditions.
- This early stage of seed growth is called *germination*.
- The roots begin to grow down, while the stem and leaves grow up.

Plant development
- Over time the seed grows into a mature plant with the structures necessary to produce more plants.

Fertilization
- When pollen, which is produced in the stamen of a flower, transfers from stamen to pistil (*pollination*) and then enters the ovule, which is located in the ovary of a flower, *fertilization* occurs.

Seed production
- Once the ovule is fertilized it develops into a seed.
- A fruit (fleshy, pod, or shell) then develops to protect the seed.
- Seeds are structures that contain the young plant surrounded by a protective covering.

It is not essential for students to know how reproduction occurs in nonvascular plants, cone-bearing plants, or spore-producing plants. Differences in the time to complete a plant's life cycle, such as annual, biennial, or perennial, are interesting but not essential. Plant meiosis is also not essential.

Assessment Guidelines:
The objective of this indicator is to *summarize* each of the processes in the life cycle of flowering plants; therefore, the primary focus of assessment should be to generalize the major points about the life cycle of seed plants (including germination, plant development, fertilization, and seed production). However, appropriate assessments should also require student to *identify* the individual stages; *illustrate* the life cycle stages using words, pictures, or diagrams; or *classify* by sequencing the stages of the life cycle.